A XEROX BUILDERS FIELD GUIDE

Building a High-Quality Concrete Slab

From Ground Preparation and Underground Services to Concrete Placement, Curing and Long-Term Performance

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INTRODUCTION

A Slab Is Simple to Describe, Not Simple to Build Well

A concrete slab may appear simple: prepare the ground, place some reinforcement, pour concrete and finish the surface.

In reality, a properly constructed slab is the result of many carefully coordinated stages. The concrete itself is only one component of the system. The soil beneath it, granular base, drainage, underground services, insulation, vapour protection, reinforcement, concrete mix, placement, finishing, curing and quality control all contribute to its long-term performance.

For homeowners, builders and site supervisors, understanding these stages matters because much of the work becomes permanently concealed once the concrete is poured.

This guide explains the major components of residential slab construction and highlights the details that deserve particular attention before, during and after the concrete pour.

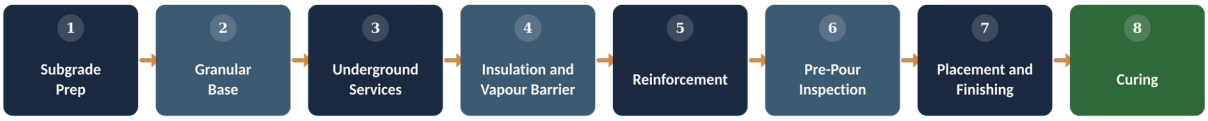


Figure 1 — The major stages of a residential slab, in sequence.

1 Ground Preparation: The Foundation Beneath the Foundation

Every concrete slab ultimately depends on the ground beneath it. Although residential slabs are often only about four to five inches thick, their performance can depend on several feet of properly prepared material below them. The quality of the slab is therefore determined long before the concrete truck arrives.

Poor soil preparation, inadequate drainage, insufficient compaction and incorrect elevations can eventually contribute to cracking, settlement, uneven floors, moisture problems, flooring failures, and costly repairs.

Understanding the Subgrade

The subgrade is the natural soil supporting the slab assembly. It ultimately carries the loads transferred through the floor, including walls, furniture, appliances, occupants and other building loads. Concrete is extremely strong in compression, but even high-strength concrete cannot compensate for unstable soil.

GUIDING PRINCIPLE

A strong concrete slab cannot overcome a poorly prepared foundation beneath it. The slab should generally be supported by stable, undisturbed soil or properly engineered and compacted structural fill.

Evaluating the Soil

Before granular material is placed, the subgrade should be carefully inspected for soft or unstable areas, saturated soil, buried organic material, previous uncontrolled fill, frost-affected areas, standing water, and evidence of previous excavation.

Soil Type	General Consideration
Dense gravel	Excellent bearing and drainage characteristics
Well-graded sand	Very good when properly compacted
Dense native glacial till	Generally excellent in many areas of British Columbia
Clay	Requires evaluation — can expand, shrink and retain moisture
Organic soil or peat	Unsuitable beneath a structural slab
Topsoil	Should be removed

BUILDER'S STANDARD

Grass, roots, leaves, buried wood, peat and other decomposing material can lose volume as they decay, creating voids beneath the slab and leading to settlement. Organic material never gets treated as structural fill on my sites — no exceptions.

2 Existing Fill and Structural Fill

Residential sites frequently contain fill from previous construction. Surface appearance alone does not establish whether fill is suitable — performance depends on material type, lift thickness, moisture content, compaction equipment, compaction procedure, and compaction testing.

Where existing fill has no reliable documentation, additional evaluation may be appropriate. Properly engineered structural fill is generally placed in controlled lifts and compacted to the density specified for the project.

BEST PRACTICE

A commonly referenced target is 95% Standard Proctor Density, although the required value depends on the project and geotechnical requirements — always confirm the specified target for your project.

3 Drainage: Control Water Before It Becomes a Problem

Water is one of the most important factors affecting foundation performance. Before installing the granular base, inspect the excavation carefully, particularly after rainfall when practical. Ask: does water drain toward the perimeter drainage system? Are there areas where water collects? Is groundwater entering the excavation? Are portions of the subgrade becoming soft? Is the excavation retaining water?

> **GUIDING PRINCIPLE**
> *Standing water beneath a future slab should never simply be ignored. Site grading, perimeter drainage, foundation drains and groundwater management are all part of the same system — not separate problems to solve later.*

4 The Granular Base

Once the subgrade has been approved, the granular base can be installed. This layer does considerably more than simply provide a surface on which to pour concrete — it distributes loads, provides drainage, protects the vapour barrier, creates a stable work platform, helps provide uniform support, and reduces the risk of differential settlement.

Selecting the Aggregate

Well-graded crushed aggregate is generally preferred because angular particles interlock during compaction. Common materials include 19 mm (¾-inch) minus crushed aggregate, 25 mm (1-inch) minus crushed aggregate where appropriate, or road base meeting applicable project specifications. Rounded river rock is generally less suitable as a structural base because its particles do not interlock as effectively.

Aggregate should be clean and free of organic material, frozen material, clay lumps, construction debris, asphalt, wood, and household waste.

> **GUIDING PRINCIPLE**
> *Anything placed beneath the slab may remain there for the entire life of the building.*

5 Granular Base Thickness

There is no single thickness that is correct for every project — required thickness depends on soil conditions, structural design, frost considerations, local requirements and geotechnical recommendations. For many residential basement slab applications, approximately 100–150 mm (4–6 inches) of granular base is common; poor soil conditions may require substantially more material or an engineered solution.

BEST PRACTICE

A consistently compacted 150 mm base can be preferable to a base whose thickness varies significantly throughout the building footprint. Uniformity matters more than chasing a maximum number.

6 Placement and Compaction

Granular material should be spread evenly rather than dumped into large piles, which can segregate and make uniform compaction more difficult. The surface should be graded using appropriate surveying or laser equipment.

BUILDER'S STANDARD

One of the most common mistakes on site is attempting to compact an excessively thick layer in a single pass. I install granular material in approximately 100–150 mm (4–6 inch) lifts, with each lift compacted thoroughly before the next goes down — using vibratory plate compactors, vibratory rollers, or jumping-jack rammers in confined areas as appropriate. Moisture content affects compaction too: too dry resists densification, too wet pumps under the compactor. Where required, field density testing verifies the specified compaction has actually been achieved.

7 Check Elevations Before Proceeding

Floor elevations should never be determined solely by visual judgment — use rotary laser levels, laser receivers, automatic levels, or surveying equipment. Small elevation errors in the base can become significant problems later, particularly with large-format tile, engineered hardwood, luxury vinyl, custom cabinetry, and large windows and doors.

GUIDING PRINCIPLE

It is much less expensive to correct an elevation problem before the concrete pour than after the slab has hardened.

8 Underground Services: The Last Chance to Make Changes Easily

Once the granular base is complete, underground services can be installed. This is one of the most important stages because virtually everything installed at this point will eventually be buried. Before concrete placement, underground services should be installed, checked, tested where required, inspected where applicable, photographed, and documented.

BUILDER'S STANDARD

Photographs of concealed work can be extremely valuable during future renovations or repairs — I photograph every service run before it disappears under concrete, every time.

9 Underground Plumbing

Drainage piping, sanitary lines, cleanouts and future connections should be installed according to the approved plumbing design. Residential drainage systems commonly use 100 mm (4-inch) main building drains, 75 mm (3-inch) branch lines, and 50 mm (2-inch) branch lines — actual sizing must comply with the applicable plumbing design and code.

CODE REQUIREMENT

Drainage piping must maintain the required slope. A commonly encountered residential slope is approximately 2% or ¼ inch per foot for smaller drainage piping, where applicable — confirm the specific requirement in your jurisdiction and design.

Before the slab is poured, verify correct elevations, proper slope, secure pipe support, required pressure or leak testing, correct fixture locations, and future connections.

GUIDING PRINCIPLE

An inexpensive sleeve or conduit installed today can save significant demolition and repair costs years later.

10 Electrical Conduits and Sleeves

Conduits beneath slabs may be required for kitchen islands, floor outlets, mechanical equipment, future electrical work, detached structures, and other future services. Conduits should be securely supported so they do not move during concrete placement, and sleeves passing through the slab should be appropriately sized and installed without compromising the surrounding concrete.

GUIDING PRINCIPLE

Moving a conduit before the pour may take minutes. Moving it after the pour may require cutting concrete.

11 Radon and Soil-Gas Protection

Radon is a naturally occurring radioactive gas produced by the decay of uranium in soil and rock. It is colourless, odourless and invisible — because it cannot be detected by human senses, protection and testing are important considerations where applicable.

Common soil-gas protection components may include a gas-permeable granular layer, a continuous sealed membrane, sealed penetrations, and a radon rough-in pipe, commonly 100 mm (4 inches), where required.

> **CODE REQUIREMENT**
> Building-code requirements for radon protection vary by jurisdiction and project. The applicable local code and project design should always be followed — do not rely on a general description like this one.

12 Rigid Insulation Beneath the Slab

Under-slab insulation is not simply about satisfying code requirements. Proper insulation can reduce heat loss, improve floor comfort, improve radiant-floor performance, reduce thermal bridging, and improve floor-temperature consistency.

Two common materials are EPS (Expanded Polystyrene) and XPS (Extruded Polystyrene); the appropriate material depends on project design and environmental conditions. Common compressive-strength ratings include 15 psi (103 kPa), 25 psi (172 kPa) and 40 psi (276 kPa) — the required strength should correspond to actual loading conditions. Typical residential under-slab insulation thickness may range from approximately 50 mm (2 inches) to 100 mm (4 inches), depending on energy-code requirements, climate and project design.

> **BEST PRACTICE**
> Insulation boards should fit tightly together. Large gaps can reduce thermal performance and allow concrete to flow beneath the boards. Damaged insulation should be replaced rather than filled with loose pieces.

13 Vapour Barrier: Small Cost, Major Protection

Concrete is not waterproof. Moisture can move through concrete by capillary action and vapour diffusion. An effective vapour barrier helps prevent ground moisture from migrating upward into flooring systems and occupied spaces.

Common polyethylene thicknesses include 6, 10, 12, 15 and 20 mil. While 6 mil polyethylene may satisfy certain minimum requirements, thicker and reinforced products can provide greater resistance to damage during construction; higher-performance products may comply with ASTM E1745, depending on the product and application.

GUIDING PRINCIPLE

A vapour barrier is only effective if it remains continuous. Pay particular attention to seams, plumbing penetrations, electrical conduits, columns, sleeves, tears and punctures. A common overlap is approximately 150 mm (6 inches), but the manufacturer's installation requirements should always control. I inspect the membrane twice — once before reinforcement goes in, and again immediately before the pour. Even a small puncture gets repaired properly, every time.

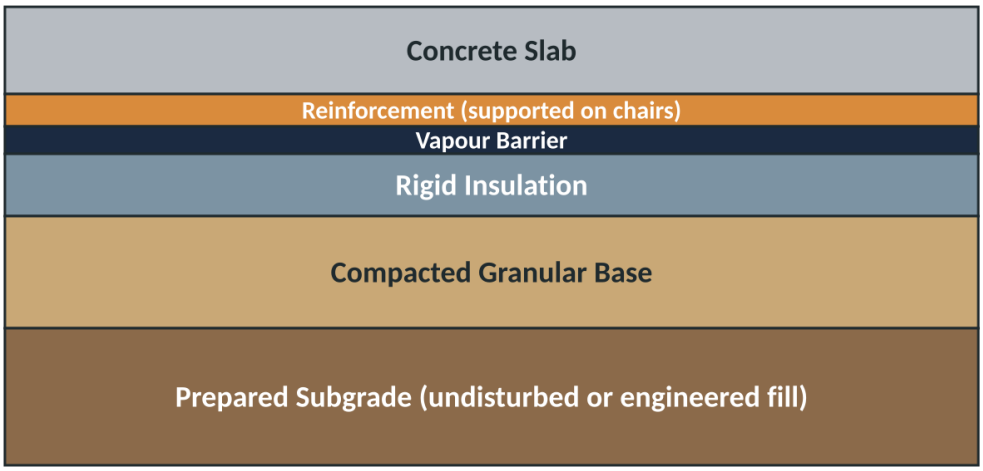


Figure 2 — A typical residential slab assembly, from subgrade to finished concrete.

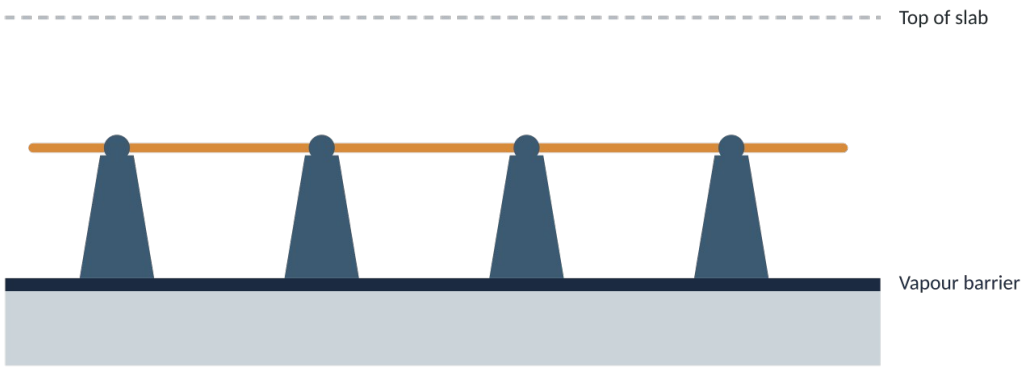
14 Reinforcement: Control, Not Elimination, of Cracking

Concrete naturally shrinks as it cures, so the purpose of reinforcement is not necessarily to eliminate cracking — proper reinforcement helps control crack width, distribute loads, maintain structural integrity and improve post-cracking performance.

Depending on the design, reinforcement may include welded wire reinforcement, deformed reinforcing bars, synthetic fibres, steel fibres, or hybrid systems. Canadian reinforcing bars commonly use metric designations such as 10M, 15M and 20M — size, spacing and placement must follow the structural design.

> **GUIDING PRINCIPLE**
>
> *Steel sitting directly on the vapour barrier is not positioned where the structural design intends it to be. Reinforcement should be supported on appropriate chairs that maintain the required position and concrete cover — typically 40–75 mm (1½–3 inches), depending on application and design. If reinforcement is displaced during construction, it gets corrected before placement continues, not after.*

Reinforcement Supported on Chairs



Rebar chairs maintain design cover — concrete surrounds reinforcement completely

Figure 3 — Reinforcement held at the correct height by chairs, not resting on the vapour barrier.

15 The Pre-Pour Inspection

Before concrete is ordered, conduct a final inspection — this is the last opportunity to correct hidden deficiencies without demolishing concrete.

- ☐ Plumbing completed and tested
- ☐ Conduits correctly positioned
- ☐ Reinforcement correctly positioned
- ☐ Sleeves installed

- ☐ Radon rough-in completed where required
- ☐ Insulation continuous
- ☐ Vapour barrier intact
- ☐ Seams and penetrations sealed
- ☐ No debris beneath the slab
- ☐ Elevations verified
- ☐ Photographs taken
- ☐ Required inspections completed

GUIDING PRINCIPLE

A few minutes of inspection before the pour can prevent days of demolition later.

16 Understanding Concrete Mix Design

Concrete is not simply cement, sand, gravel and water — modern concrete is an engineered construction material. The mix is selected based on structural requirements, expected loading, exposure conditions, weather, placement method, required workability, and intended use. A basement slab inside a conditioned home does not necessarily require the same concrete specification as an exterior driveway exposed to freezing and de-icing salts.

17 Concrete Strength: Understanding MPa

Concrete strength in Canada is generally specified in megapascals (MPa). One MPa is approximately 145 psi.

Strength	Approximate psi
20 MPa	2,900 psi
25 MPa	3,600 psi
30 MPa	4,350 psi
32 MPa	4,640 psi
35 MPa	5,000 psi
40 MPa	5,800 psi

> **GUIDING PRINCIPLE**
>
> *Higher strength does not automatically mean better concrete. Increasing strength can affect workability, finishing characteristics, shrinkage behaviour and cost. The correct concrete is the one that matches the structural design and project requirements — not simply the highest number available.*

18 What Makes Concrete Strong?

Concrete strength depends on the water-cement ratio, aggregate quality, cement content, batching accuracy, consolidation, curing, and age. Concrete is commonly evaluated based on its 28-day compressive strength, and strength develops progressively — approximately 15–20% at 24 hours, 35–45% at 3 days, 60–70% at 7 days, and full design strength at 28 days. Actual results vary according to mix design, temperature and curing conditions.

19 Aggregate: The Largest Ingredient

Aggregate typically represents approximately 60–75% of the volume of concrete, with a significant effect on strength, shrinkage, durability and finishability. Common nominal aggregate sizes include

10 mm (⅜ inch), 14 mm (½ inch), and 20 mm (¾ inch) — the appropriate size depends on the reinforcement, placement method and structural requirements.

20 Water: More Is Not Better

Water is essential for cement hydration. However, adding excessive water after concrete has been batched can seriously affect performance — excess water can reduce strength, increase shrinkage, increase cracking, increase permeability, promote dusting, increase curling, and delay finishing.

> **GUIDING PRINCIPLE**
>
> *Concrete should be ordered with the required workability. It should not simply be made wetter on site. Where additional workability is needed, an appropriate water-reducing admixture provides better results without unnecessarily increasing the water-cement ratio.*

21 Understanding Slump

Slump measures the consistency or workability of fresh concrete — it does not measure concrete strength. Typical residential values range from 50 mm (2 inches, very stiff) to 100–120 mm (4–5 inches, increased workability); 80–100 mm (3–4 inches) is common for residential placement.

> **BUILDER'S STANDARD**
>
> A high slump caused by additional water on site is not equivalent to a high slump achieved through a properly designed admixture. Higher workability, when needed, comes from admixtures on my projects — not from a hose.

22 Air Entrainment

Concrete exposed to freezing and thawing conditions may require air entrainment — microscopic air bubbles that provide space for freezing water to expand. Typical air contents for exterior residential applications may be approximately 5–8%, depending on aggregate size and applicable specifications. Air entrainment should not be confused with trapped air caused by poor consolidation: one is intentional, the other is a defect.

23 Chemical Admixtures

Modern concrete may include water reducers, superplasticizers, retarders, accelerators, shrinkage-reducing admixtures, or corrosion inhibitors. Admixtures should be selected according to actual project requirements rather than used without a specific purpose.

24 Fibres in Concrete

Synthetic and steel fibres are increasingly used in residential concrete to reduce plastic shrinkage cracking, improve impact resistance, and increase toughness.

GUIDING PRINCIPLE

Fibres should not be assumed to replace structural reinforcement unless specifically engineered and approved for that purpose.

25 Ordering Concrete

Before ordering concrete, confirm required volume, waste allowance, pump requirements, truck access, delivery sequence, concrete strength, aggregate size, slump, air content, admixtures, weather conditions, and placement schedule. Good communication between the builder and ready-mix supplier can prevent significant delays and mistakes.

26 Read the Ready-Mix Delivery Ticket

Every concrete truck should arrive with a delivery ticket — an important quality-control record identifying batch time, mix identification, concrete strength, quantity, slump specification, air specification, admixtures, water added at the plant, and arrival time.

> **BUILDER'S STANDARD**
>
> The delivery ticket provides valuable documentation if questions arise later concerning the concrete supplied. I keep every ticket, every pour, no exceptions.

27 Weather Can Change the Pour

Concrete reacts differently under different environmental conditions. Hot, dry or windy conditions accelerate evaporation and increase the risk of plastic shrinkage cracking. Cold weather slows hydration, and concrete must be protected from freezing before sufficient strength develops. Rain during placement can damage the surface if not managed properly.

> **BEST PRACTICE**
>
> A professional concrete pour should always have a weather contingency plan — decided before the trucks are on their way, not improvised once they arrive.

28 Concrete Placement

Once the first truck arrives, preparation gives way to execution. The pump operator, placing crew, screed operators and finishers should operate as one coordinated team. Concrete pumps make residential placement faster and more efficient — boom pumps provide significant reach, while line pumps are useful where access is restricted. The discharge hose should remain as close as practical to the final placement location; excessive free-fall or unnecessary movement can contribute to segregation.

29 Place Concrete Continuously and Uniformly

Concrete should be placed in a controlled sequence, avoiding large piles pushed long distances across the slab. Controlled placement helps maintain uniform thickness, reinforcement position, and consistent quality. Placement should generally proceed from the farthest area toward the exit, with reinforcement remaining supported throughout.

30 Consolidation and Vibration

Fresh concrete contains trapped air; if it remains, it can reduce strength and create voids or honeycombing. Consolidation removes trapped air and helps concrete surround reinforcement. Internal vibrators commonly operate in the range of approximately 8,000–12,000 vibrations per minute, depending on equipment.

> **GUIDING PRINCIPLE**
>
> *Over-vibration is also a problem — excessive vibration can contribute to segregation, excessive bleeding and uneven surfaces. The purpose of vibration is to remove trapped air, not to transport concrete across the slab.*

31 Screeding: Where Flatness Is Created

A common misconception is that finishing creates a flat floor. In reality, the floor becomes flat during screeding, which establishes the finished elevation by removing excess concrete and filling low areas. Laser-controlled benchmarks provide accurate elevation control; straightedges commonly used for residential slabs range from approximately 2.4–4.8 metres (8–16 feet).

> **GUIDING PRINCIPLE**
>
> *Low areas should be corrected while the concrete remains workable. Once the concrete begins to set, correction becomes significantly more difficult.*

32 Flat Is Not the Same as Level

A floor can be smooth without being flat, and flat without being perfectly level. This distinction matters particularly for large-format tile, engineered hardwood, luxury vinyl, and custom cabinetry. Commercial floors are often evaluated using FF (Floor Flatness) and FL (Floor Levelness) measurements under ASTM E1155; these are not routinely specified for every residential project, but the underlying principle remains — the better the original slab, the less corrective work is required later.

33 Bull Floating

Bull floating follows screeding, helping remove minor screed marks, push larger aggregate slightly below the surface, fill small depressions, and begin smoothing the surface. It is not a substitute for proper screeding — significant highs and lows should be corrected before this stage.

34 Bleed Water: Know When to Wait

Fresh concrete naturally releases some water toward the surface — this is called bleeding, and it is normal. The problem occurs when finishing begins while bleed water remains on the surface, which can contribute to dusting, delamination, scaling, reduced abrasion resistance, and premature deterioration.

> **GUIDING PRINCIPLE**
> *Let the concrete determine when finishing begins — not the schedule.*

35 Power Troweling

Once the concrete has stiffened sufficiently and bleed water has disappeared, mechanical finishing can begin, using walk-behind or ride-on trowels across multiple passes. Starting too early can damage the surface; starting too late can make finishing significantly more difficult.

36 Surface Finishes

The appropriate finish depends on the intended application: a steel trowel finish gives a smooth, dense result common for interior applications; a broom finish is commonly used for exterior areas where additional slip resistance is desirable; a machine finish is often used where the concrete will subsequently receive finished flooring; and decorative finishes may include exposed aggregate, stamped concrete, or polished concrete. The finish should always be applied at the appropriate stage of setting.

37 Final Inspection Before Curing

Before curing begins, inspect the completed slab for surface flatness, uniform texture, edge finishing, joint locations, standing bleed water, exposed reinforcement, visible honeycombing, and

any damaged areas requiring correction. Only after the slab has been properly finished and accepted should curing begin.

38 Curing: The Beginning of Concrete's Long-Term Life

The concrete may look finished, but it is not finished developing. Concrete gains strength through hydration, a chemical reaction between cement and water. If moisture escapes too quickly, hydration can be reduced — poor curing may contribute to lower strength, increased shrinkage, surface dusting, reduced abrasion resistance, and increased cracking.

39 Curing Methods

Common curing approaches include membrane-forming curing compounds, moist curing, wet burlap, curing blankets, and polyethylene sheeting. The method must be compatible with the intended finished flooring — some curing compounds can interfere with flooring adhesives.

> **CODE REQUIREMENT**
>
> Many specifications require a curing period of at least seven days, although requirements vary according to the concrete mix, weather, cement type, admixtures and project specifications. Always verify curing-compound compatibility with the flooring manufacturer before applying it.

40 When Can the Slab Be Used?

General guidance: light foot traffic after approximately 24–48 hours; framing operations often after 2–7 days; heavy concentrated loads only after sufficient strength has developed; design strength typically evaluated at 28 days. These are general guidelines — project specifications and the structural engineer's recommendations take precedence.

> **GUIDING PRINCIPLE**
>
> *Concrete feeling hard does not necessarily mean it is ready for heavy construction loads.*

41 Concrete Will Crack

Concrete shrinks. As moisture leaves the concrete, internal tensile stresses develop, and because concrete is relatively weak in tension, cracking can occur. The objective is therefore not necessarily to eliminate every crack — it is to minimize unnecessary cracking, control crack location, control crack width, and maintain structural performance.

42 Control Joints

Control joints create intentional planes of weakness so shrinkage cracking is encouraged to occur in planned locations, through saw cutting, tooled joints, or preformed joint systems. Saw cutting should occur early enough to reduce random cracking but after the concrete is sufficiently strong to avoid excessive raveling.

> **BEST PRACTICE**
>
> Joint layout should be planned before the pour. Where practical, slab panels should remain reasonably square — long, narrow panels and inside corners increase stress concentrations.

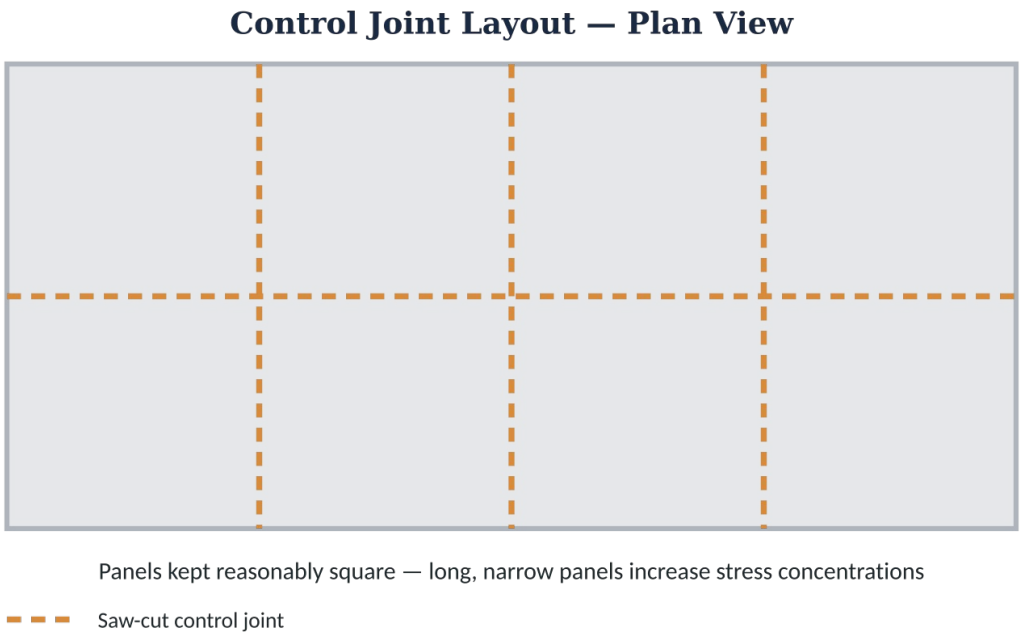


Figure 4 — A control joint layout keeping panels reasonably square.

43 Common Causes of Cracking

Although some cracking is unavoidable, many factors increase the risk: excessive water added on site, poor subgrade preparation, inadequate compaction, improper curing, rapid moisture loss, delayed saw cutting, settlement, improper reinforcement placement, and poor joint layout.

> **GUIDING PRINCIPLE**
> *The important question is not simply "how do we repair the crack?" It is "why did the crack occur?" Understanding the cause is essential to selecting the appropriate corrective action.*

44 Common Concrete Failures

Failure	Typical Cause
Settlement	Inadequate compaction or unstable soil
Honeycombing	Inadequate consolidation, leaving voids around reinforcement
Surface dusting	Finishing over bleed water, excess water, or inadequate curing
Scaling	Freeze-thaw exposure, de-icing salts, or poor surface quality
Curling	Differential shrinkage between top and bottom of slab
Delamination	Separation of surface layer, often linked to trapped bleed water
Birdbaths	Low areas from deficiencies in screeding or surface elevation

45 Finished Flooring Depends on the Slab

Flooring failures are sometimes blamed on installers when the actual problem originates in the concrete substrate. Different flooring products have different substrate requirements — some systems require the floor to remain within approximately 3 mm (⅛ inch) variation over 3 metres (10 feet), though the exact requirement must always come from the flooring manufacturer's installation instructions.

> **BEST PRACTICE**
> Grinding, patching and self-leveling compounds can correct out-of-tolerance areas, but they should not become a substitute for achieving good slab flatness during original construction.

46 Moisture Before Flooring Installation

A concrete slab can appear dry while still containing significant moisture. Installing moisture-sensitive flooring too early can contribute to adhesive failure, cupping, curling, staining, moisture-related damage, and mould problems.

CODE REQUIREMENT

Depending on the flooring system, moisture may be evaluated through relative humidity testing, calcium chloride testing, or appropriate moisture meters. Always follow the flooring manufacturer's moisture limits — ignoring those requirements may affect the flooring warranty.

47 Quality Assurance: A Complete Slab Checklist

A quality slab is inspected throughout its entire construction process — not just at the end.

Before the Pour

- ☐ Subgrade inspected
- ☐ Soil conditions confirmed
- ☐ Granular base installed
- ☐ Base thickness verified
- ☐ Compaction completed
- ☐ Elevations checked
- ☐ Drainage confirmed
- ☐ Underground plumbing completed
- ☐ Conduits and sleeves installed
- ☐ Radon provisions completed where required
- ☐ Insulation installed
- ☐ Vapour barrier inspected
- ☐ Reinforcement correctly positioned
- ☐ Required inspections completed
- ☐ Photographs taken

During the Pour

- ☐ Delivery tickets reviewed
- ☐ Concrete specifications confirmed
- ☐ Slump monitored
- ☐ Placement sequence controlled
- ☐ Reinforcement remains supported
- ☐ Proper consolidation performed
- ☐ Screeding controlled by established elevations
- ☐ Bleed water allowed to dissipate
- ☐ Finishing begins at the appropriate time

After the Pour

- ☐ Surface inspected
- ☐ Joints installed
- ☐ Curing initiated
- ☐ Flatness checked where required
- ☐ Moisture evaluated before flooring
- ☐ Construction records retained

48 Building Beyond Minimum Code

Building codes establish minimum requirements for safety and performance. Minimum code should not automatically be interpreted as the best possible construction standard.

BUILDER'S STANDARD

Where budget and design objectives permit, I look at improvements such as more durable vapour-barrier products, increased under-slab insulation, improved floor flatness, photographing concealed work, carefully reviewing concrete delivery tickets, avoiding unnecessary water addition, extending curing where practical, and improving documentation and quality control. These measures often represent a relatively small portion of the overall construction cost while providing meaningful long-term benefit.

49 The Most Important Lessons to Remember

If a homeowner or builder remembers only a few principles from this guide, they should be these:

1. **The slab begins with the soil**
   Concrete cannot compensate for unstable or poorly prepared ground.
2. **Water must be controlled**
   Drainage and moisture management should be addressed before the concrete is placed.
3. **Compaction matters**
   A properly compacted base reduces the risk of future settlement.
4. **Uniform elevations matter**
   It is far easier to create a flat slab during construction than to correct it afterward.
5. **Everything buried should be documented**
   Photograph plumbing, conduits, insulation, vapour barriers, and reinforcement before the pour.
6. **Do not add unnecessary water**
   More water may ease placement, but it compromises designed performance.
7. **Reinforcement must be in the correct position**
   Steel resting on the bottom of the slab is not doing its intended job.
8. **Do not finish concrete too early**
   Bleed water must be managed properly before finishing.
9. **Flatness is created during screeding**
   Finishing cannot completely correct a poorly screeded slab.
10. **Concrete needs curing**
    The slab continues developing strength after it becomes hard to the touch.
11. **Concrete can crack**
    The goal is to control and minimize cracking, not assume every crack is preventable.
12. **Quality control begins before the truck arrives**
    The best slab is the result of hundreds of correct decisions, not one excellent pour.

CLOSING

Conclusion

A concrete slab is one of the most important components of a home, yet much of it disappears from view shortly after construction. The homeowner may eventually see only the finished flooring. Beneath that flooring, however, are layers of soil, compacted aggregate, drainage systems, plumbing, electrical conduits, insulation, vapour protection, reinforcement and concrete — all working together as one building system. The long-term performance of that system is determined by the quality of each stage.

Good slab construction therefore begins long before concrete placement and continues well after the finishing crew leaves the site. The most durable results come from careful preparation, appropriate materials, accurate installation, disciplined quality control and proper curing.

For homeowners, understanding these fundamentals makes it easier to ask informed questions and recognize quality construction. For builders and site supervisors, they provide a framework for consistent quality control.

> **GUIDING PRINCIPLE**
> *What happens beneath the finished floor matters just as much as what you can see above it.*

IMPORTANT NOTICE

Please Read Before Using This Guide

This guide is an educational resource. It does not replace, and must not be treated as a substitute for:

- The current British Columbia Building Code, National Building Code of Canada, or any other applicable code in force at the time of construction.
- Municipal or regional-district bylaws, permit conditions, and inspection requirements.
- Site-specific structural, geotechnical, or engineering design prepared by a licensed professional.
- Manufacturer installation instructions for any specific product.
- The professional and legal judgment of the engineers, geotechnical consultants, and other registered professionals engaged on a specific project.

The technical values, ranges and examples in this guide are general construction information. Actual requirements can vary according to structural design, geotechnical conditions, local building and plumbing codes, climate, exposure conditions, manufacturer specifications, and project-specific engineering.

Where a conflict exists, the applicable building code, engineered drawings, geotechnical recommendations, manufacturer's installation instructions and qualified professionals take precedence over this guide.

> **GUIDING PRINCIPLE**
>
> *This guide reflects the author's own field research, training, and construction experience. It has not yet been reviewed by an independent geotechnical, structural, or legal professional. Readers must verify every technical statement against the current, authentic codes, standards, and manufacturer instructions applicable to their project before relying on it.*

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